Assignment-3

1. Let $B = \{0, 1\}$. Prepare an input/output table for the boolean function,
   $f : B^2 \to B$, $f(x_1, x_2) = x_1 \cdot x_2'$

2. Check whether the following argument is valid or not :
   Hypothesis : $S_1 : p \Rightarrow (\sim q)$,
   $S_2 : r \Rightarrow q$,
   $S_3 : r$
   Conclusion : $S : \sim p$

3. What will be the truth value of following statement :
   $\{p \Rightarrow (q \Rightarrow r)\} \Rightarrow \{(p \Rightarrow q) \Rightarrow (p \Rightarrow r)\}$.

4. Express boolean function
   $f(a, b, c) = (a \cdot b) + (a \cdot c) + (b \cdot c)$ as a product of sums in three variables.

~~5. Check Show that (D8, +,~~

5. Check whether $(D_{10}, +, \cdot, ', 1, 10)$ is a boolean algebra or not,
   $\forall x, y \in D_{10}$,
   $x + y =$ LCM of x & y.
   $x \cdot y =$ GCD of x & y
   $x' = \frac{10}{x}$

Date:

6. Check whether ~~D12~~ $(D_{12}, +, \cdot, ', 1, 12)$ is a boolean algebra or not.

$\forall x, y \in 12,$

$x + y =$ LCD of x & y.

$x \cdot y =$ GCD of x & y.

$x' = \dfrac{12}{x}$.